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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Complete if Known					
Application Number	10/533,914	_			
Filing Date	05/05/2005	_			
First Named Inventor	Gary Haughton	_			
Art Unit	1723	_			
Examiner Name	David L., Serkin SOOHOO	_			
Attorney Docket Number	P1112US04	7			

			U. S. PATEN	DOCUMENTS	
Examiner Initials*	Cite No.1	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
· ITCI	_	Number-Kind Code ^{2 (f known)}	10.11.0001		Figures Appear
/TS/		^{US-} 6,830,369	12-14-2004	Haughton et al.	
1		^{US-} 6,070,348	06-06-2000	Blanchetti	
1		US- 6,007,237	12-28-1999	Latto	
		^{US-} 5,947,784	09-07-1999	Cullen	
T		^{US-} 5,813,760	09-29-1998	Strong	
1		^{US-} 5,738,018	04-14-1998	Burnett	
1		US- 5,100,242	03-31-1992	Latto	
		US- 5,052,813	10-01-1991	Latto	
		^{US-} 4,534,914	08-13-1985	Takahashi et al.	
1		^{US-} 4,440,616	04-03-1984	Houseman	
		US- 4,439,300	03-27-1984	Houseman	
		^{US-} 4,319,971	03-16-1982	Good et al.	
T		^{US-} 4,302,318	11-24-1981	Mock	
		US- 4,189,362	02-19-1980	Dotson	
		US- 4,169,681	10-02-1979	Kato	
		US- 4,125,439	11-14-1978	Fleischmann et al.	
		^{US-} 4,054,503	10-18-1977	Higgins	
V		^{US-} 3,912,237	10-14-1975	Ostberg et al.	
/TSX		^{US-} 3,560,366	02-02-1971	Fisher	

		FORE	GN PATENT DOCU	IMENTS		
Examiner Citi		Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages	
		Country Code ³ Number ⁴ Kind Code ³ (if known)	MM-DD-YYYY	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	Or Relevant Figures Appear	T ⁰
√/TS/		DE 75 04 145 U	06-19-1975	Muller		
		SU 858 898 A	08-30-1981	Umamskii		
		SU 967 541 A	10-23-1982	Fomenko		
		FR 2 605 244 A	04-22-1988	Bionaz		
\.		WO 02/083280 A1	10-24-2002	Amosco Technology Ltd.		
/TSN		JP 11 184 420 A	07-09-1999	Mitsubishi Electric Corp.		

Examiner		Date	07/07/2007
Signature	/Tony Soohoo/	Considered	07/07/2007
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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Application Number	10/533,914				
Filing Date	05/05/2005				
First Named Inventor	Gary Haughton				
Art Unit	1723				
Examiner Name	David L. Corkin SOOHOO				
Attorney Docket Number	P1112US04				

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Examiner Initials*	Cite No.1	Document Number Number-Kind Code ^{2 (# known)}	Publication Date MM-DD-YYYY	Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevan Figures Appear
/TS/		^{US-} 3,214,148	10-26-1965	Thomas	
		^{US-} 2,661,938	12-08-1953	Kuentzel et al.	
1		^{US-} 2,615,692	10-28-1952	Muller	,
1		^{US-} 2,557,503	06-19-1951	Hogaboom, Jr.	
1		^{US-} 2,064,402	12-15-1936	Bannister et al.	
1		^{US} : 1,408,596	03-07-1922	Heinrich	
		^{US-} 1,345,312	06-29-1920	Blake	
$\overline{\Lambda}$		US- 567,503	09-08-1896	Pelatan & Clerici	
/TS/		US- 52,890	02-27-1866	Ryerson	
		US- ·			
		US-			
		UŞ-	1		

		FORE	GN PATENT DOCU	IMENTS		
Examiner Initials*	Cite No.1	Foreign Patent Document	Publication Date	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages	
		Country Code ³ Number ⁴ "Kind Code ⁵ (if known)	MM-DD-YYYY		Or Relevant Figures Appear	T⁰
/TS/		GB 1 147 378 A	04-02-1969	Davis	,	
		JP 63104638	05-10-1988	Yoshida Masatoshi		
		DE 7416500	08-22-1974	Messerschmit-Bolkow-Blohm		
137	·	FR 1 604 693 A	01-03-1972	Institit Merieux		
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ı	Examiner		Date	
		/Tony Soohoo/		. \7/\7/2\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\\
	Signature	/Tony Soohoo/	Considered	1 07/07/2007 1
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Substitute	e for form 1449/PTO			Complete If Known		
Cobolinati	7 (3. 1011) 1 7 7 611			Application Number	10/533,914	
INFO	RMATION	I DIS	CLOSURE	Filing Date	05/05/2005	
STA	TEMENT E	BY A	PPLICANT	First Named Inventor	Gary Haughton	
	(Use as many she		engang d	Art Unit	1723	
	(USO as many sn	ets as ne	cossury)	Examiner Name	David L. Sorkin SOOHOO	
Sheet	3	of	5	Attorney Docket Number	P1112US04	

,			NON PATENT LITERATURE DOCUMENTS	
		Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
/TS/		•	TURNER, J.S. Intermittent Release of Smoke from Chimneys. Journal of Mechanical Engineering Science 1960, Vol. 2, No. 2, pages 97-100.	
			KENDIG, F. The Science of Smoke Rings and Doughnuts. Saturday Review, March 18, 1972, pages 40 and 44.	
	I	!	MAXWORTHY, T. Turbulent Vortex Rings. J. Fluid Mech. 1974, Vol. 64, Part 2, pages 227-239.	
			BAIRD et al. Velocity and Momentum of Vortex Rings in Relation to Formation Parameters. The Canadian Journal of Chemical Engineering, February 1977, Vol. 55, pages 19-26.	
			MAXWORTHY, T. Some Experimental Studies of Vortex Rings. J. Fluid Mech. 1977, Vol. 81, Part 3, pages 465-495.	
			SAFFMAN, P.G. The Number of Waves on Unstable Vortex Rings. J. Fluid Mech. 1978, Vol. 84, Part 4, pages 625-639.	
			ROHATGI, A. Mixing Effects and Hydronamics of Vortex Rings. Ph.D. Thesis at McMaster University, Hamilton, Ontario, June 1978.	
		i	PULLIN, D.I. Vortex Ring Formation at Tube and Orifice Openings. Phys. Fluids 22(3), March 1979, pages 401-403.	
			ROHATGI et al. Mixing Effects and Hydrodynamics of Vortex Rings. The Canadian Journal of Chemical Engineering, August 1979, Vol. 57, pages 416-424.	
V/TS	S/		DIDDEN, N. On the Formation of Vortex Rings: Rolling-Up and Production of Circulation. Journal of Applied Mathematics and Physics (ZAMP) 1979, Vol. 30, pages 101-116.	

Examiner	/Tanu Caalaaa/	Date	07/07/0007
Signature	/Tony Soohoo/	Considered	07/07/2007

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Applicant's unique citation designation number (optional). ² Applicant is to place a check mark here if English tanguage Translation is attached.

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Subetitut	te for form 1449/PTO			Complete If Known		
Jubana	10 10 10 11 140 10			Application Number	10/533,914	
INFO	ORMATION	DIS	CLOSURE	Filing Date	05/05/2005	
STA	STATEMENT BY APPLICANT			First Named Inventor	Gary Haughton	
	Alexan maguaba			Art Unit	1723	
	(Use as many she	ers as n	ecessary)	Examiner Name	David L. Sorkin SOOHOO	
Sheet	4	of	5	Attorney Docket Number	P1112US04	

			NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*		Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-iss number(s), publisher, city and/or country where published.	
/TS/			Ontario Ministry of the Environment, Water Resources Branch, Province of Ontario. Hamilton Harbour Study 1977, March 1981, pages 1-A11.	
	\int		ROHATGI et al. Gas Absorption at a Liquid Surface Agitated by Vortex Rings. The Canadian Journal of Chemical Engineering, June 1981, Vol. 59, pages 303-309.	
			GLEZER, A. An Experimental Study of a Turbulent Vortex Ring. Ph.D. Thesis at California Institute of Technology, Pasadena, California, 1981.	
			SU 858 898B (UMANSKII, M.P.) 1981.08.30. (abstract), Soviet Patent Abstracts, Week 198225, London: Derwent Publications Ltd., AN 1982-51962E.	
			SU 967 541 A (FOMENKO, Y.) 1982.10.23. (abstract), Soviet Patent Abstracts, Week 198334, London: Derwent Publications Ltd., AN 1983-745919.	
			AHMAD et al. Mixing of Stratified Liquids. Chem. Eng. Res. Des. May 1985, Vol. 63, pages 157-167.	
			LATTO, B. "New Mixer for Slumes and Stratified Fluids" In: Proc. 12th Int. Conf. on Slurry Technology: March 31-April 3, 1987, New Orleans, Louisiana, U.S.A	
			JP 63 104638 A (MASATOSHI). Patent Abstracts of Japan, Vol. 12, no 344 (C-528), 1988.05.10 (abstract).	
\int			LATTO et al. Mixing of Thermally Stratified Fluids by Injecting a Series of Vortex Rings – A Numerical Simulation. Trans IChemE, September 1990, Vol. 68, Part A, pages 457-463	
V /T:	S/		LATTO et al. "Use of Vortex Rings for Mixing". In: Industrial Applications of Fluid Mechanics 1990, ASME, New York, FED, Vol. 100, pages 79-86.	

Examiner	/Tarry Oardens/	Date	07/07/0007
Signature	/Tony Soohoo/	Considered -	07/07/2007

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Substitute for form 1449/PTO				Complete If Known		
		•		Application Number	10/533,914	
INFO	ORMATION	DIS	CLOSURE	Filing Date	05/05/2005	
STATEMENT BY APPLICANT				First Named Inventor	Gary Haughton	
	(Use as many she	:ata ao a		Art Unit	1723	
	Ose as many sne	ets as n	ecessary)	Examiner Name	David L. Sorkin SOOHOO	
Sheet	5	of	5	Attorney Docket Number	P1112US04	

Fuereins:	Cita	NON PATENT LITERATURE DOCUMENTS	
Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T²
/TS/		HUA, F. Numerical Simulation and Experimental Study of the Behaviour of Vortex Rings. Ph.D. Thesis at McMaster University, Hamilton, Ontario, 1994.	
/TS/		JP 11 184 420 A (MISTUBISHI ELECTRIC CORP.) 1999.07.09 (abstract). Japan Patent Abstracts, Section PQ, Week 199938, London: Derwent Publications Ltd., Class P85, AN 1999-44842	
/TS/		JP 11 184 420 A (MISTUBISHI ELECTRIC CORP.) Patent Abstracts of Japan, Vol. 1999, no. 12, 1999.07.09 (abstract).	

Examiner	Tony Sochool	Date	07/07/2007
Signature	/Tony Soohoo/	Considered	07/07/2007

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